

EPICS software upgrade and areaDetector-3-2 deployment at NSLS2 beamlines



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Summary

- New EPICS Debian distribution deployment at the new beamline.
- areaDetector training event for beamline scientists.

NSLS2 now

- Currently NSLS2 is home to 27 beamlines
- + 2 will be built this year
- First 6 beamlines were built 4 years ago, and are taking general users for 3 years
- \exists this rule: when something is built, and it works, don't touch it.
- Debian 7 on IOC servers
- EPICS 3.14 base and areaDetector-1-9 on most beamlines.

Upgrade decision

- At some point maintaining old software becomes expensive
- Need new Debian distribution for the very least.
- Mid-November 2017 we decided to test new Debian distribution on a real system.
- From EPICS community:
 - Updates pushed to epicsdeb are tested at FRIB
- Need to TEST to obtain credibility for a change.

The easiest path to upgrade...is to start from something new

- On newly constructed beamline 28ID1 PDF
- The right way is to built 2 parallel control systems:
 - Debian 7  Wheezy + old repo
 - Debian 8  Jessie + new repo
- In reality resources allowed only one deployment.

Outcome of the upgrade efforts..

- PDF beamline passed IRR with new Debian distribution on Debian 8 built from epicsdeb @ NSLS2.
- areaDetector-3-2 was deployed for prosilica diagnostic cameras.
- To expose new features new .opi screens for asyn and areaDetector were deployed. These screens were auto-converted by Mark Rivers and are available now in github in ../autoconvert/.
- New distribution was tested live, with utmost suspicion and attention to every problem on the top of PDF complexity.
- EPICS software upgrade way forward have been established for the interested beamlines.



areaDetector-3-2 training for beamline scientists

- Goals:
 - Promote EPICS software upgrade
 - Advertise PVA and EPICS7
- Good timing :
 - New Debian distribution
 - areaDetector-3-2 with latest Epics7 base.
 - A real beamline with all above deployed.
- Should be on the real HW and a real beamline.

Workshop

- Lecture
- Hands On Labs hosted by
28ID1(11 cameras)
11ID (13 cameras)
- AM + PM (20 + 20)



- Everyone had a prosilica camera with IOC at the beamline to play with.

Good bonding time between controls and scientists



Training details...



The screenshot shows the NSLS-II 28ID1 Launch Page software interface. The interface displays various system status indicators and control panels. A red oval highlights a list of cameras in the center of the screen.

NSLS-II
NATIONAL SYNCHROTRON LIGHT SOURCE II

PDF 28ID1 Launch Page

Beamline Status

- Stored beam
- Shutters enabled
- Beamline enabled
- ID gap closed
- FE shutter open
- EPS OK
- Hutch beam on

Machine

- Storage ring
- Insertion device
- Front end

Vacuum Subsystem

- FE Vacuum
- 28ID1 Vacuum
- 28IDA RGA
- 28IDC RGA2

Utilities

- Mechanical
- Electrical
- Racks
- EPS

Controls

- IOCs
- Controls Test Area
- Bridge Motions

Surveillance cameras

- Axis cameras
- Analog cameras
- Diagnostics
- FS motion

28ID1 ES

- OCM Table
- OCM SRTs
- Laser, Riker Wheels
- ECS Sample Env
- Opt. Table
- Bridge Motions
- PerkinElmer

Camera List (circled in red):

- Cam Ivan So
- Cam PDF..1
- Cam CMS1
- CMS 2
- Cam GAS1
- Cam GAS2
- Cam GAS3
- Cam IT1
- Cam StuM
- Sim1
- Sim2
- Sim3
- Sim4
- Cam FISMET1
- Cam FISMET2
- Cam FISMET3
- Cam FISMET4

Console Log Messages

ok.sara

Conclusions

- Successfully deployed new EPICS Debian distribution on a new beamline. Overcame a potential barrier of a change.
- Demonstrated that areaDetector can be upgraded on every interested beamline, running any Debian.
- By running a training for beamline scientists advertised benefits of keeping EPICS software updated and did a good job positioning PVA and EPICS7.

Credits:



- Anton Derbenev for NSLS2 new Debian distribution.
- Kay Kasemir for perfecting .adl to .opi translator, and BOY fixes along the way.
- Leon Flaks for Debian delivery and admin help.
- John Trunk for mounting and focusing 10 cameras for the training labs.
- Matt Cowan, Kunal Shroff for help running the areaDetector-3-2 labs.
- Kazimierz Gofron for media efforts. Video and text are available @ <https://www.bnl.gov/ps/epics/>
- Richard Farnsworth for support including project \$\$ and Zen Tranquility.
- AND

Mark Rivers for



Inspirational collaborator

- Changing areaDetector make to work with Debian distribution.
- Translating areaDetector and asyn .opi screens.
- areaDetector workshop and beamline's visits @ NSLS2.
- Adding new features to address NSLS2 needs.

Thank you !

Inspirational
collaborator